

LIHMR UNIVERSITY
Institute of Health Management Research
MBA Hospital and Health Management
Batch-22 (2017-2019)
Hospital Management
Operations Management in Hospitals
Term Examination



Time - 3 Hour

MM-70

The question paper contains 3 printed pages.

Instructions

1. The question paper contains 8 Questions. Candidates are required to answer any five (5) questions.
2. All questions carry equal marks..

- Q. 1.** What is operations management? How you can apply in healthcare services production. Explain the various operations management tools and techniques that could be applied in hospitals. **[14]**
- Q. 2.** A hospital is considering a new computerized information and inventory management system. The following information has been gathered regarding the installation and implementation of the system;

	Activity	Description	Immediate Predecessors	Duration (days)
Start	A	Select the computer model	-	6
	B	Design input / output system	A	12
	C	Design monitoring system	A	10
	D	Assemble the computer hardware	B	20
	E	Develop the main programmes	B	11
	F	Develop input/output routines	C	8
	G	Create Database	E	6
	H	Install the system	D,F	3
Finish	I	Test and implement	G,H	6

Draw an Activity on arrow network for the project. Determine the critical path and compute the minimum time for the implementation of the computerized production and inventory management system. Also find the floats of non-critical activities.

[4+4+6]

- Q. 3.** (a) Explain the mathematical structure of linear programming which could be used in resource allocation in hospitals. **[4]**

(b) An insurance company desires to enter the health care market and offer its potential customers both a staff model health maintenance organization (HMO) and commercial indemnity insurance. The company is deciding how to allocate its marketing efforts between those options to maximize its profits. The analysts have estimated that the company will realize a profit of \$ 1,200 per enrollee from the HMO, and \$ 600 per enrollee from commercial plans. Furthermore, for the coming year the company is forced to rely on its present resources in terms of sales force. The

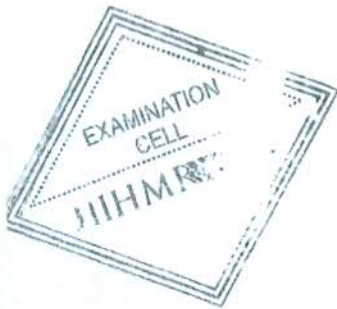
administrative support of the HMO will take two hundred hours, and the commercial administration will take, on average, four hundred hours; currently, the company can allocate 1.6 million hours to sales. To break even, the HMO requires that the contribution margins (contribution margin is sales revenue less variable costs) for enrollees must exceed \$ 1.5 million. The estimated contribution margins are \$ 500 and \$ 300, for HMO and for commercial insurance enrollees, respectively. With a limited number of physicians participating in the staff model HMO at the present time, the HMO can handle at most 5,000 enrollees.

Formulate the problem and identify the decision variables and find out how the resources should be allocated to each program so as to maximize the profits. Explain your solution by drawing a neat graph. [10]

Q. 4. (a) What do you understand by Resource Leveling & Resource Smoothing in hospital project management. [4]

(b) The activities of a hospital project are tabulated with the corresponding resource requirement is shown below:

Activity	Immediate Predecessor	Activity Time (weeks)	Number of resource units
A	-	4	2
B	-	4	1
C	-	4	2
D	A	2	5
E	B	3	2
F	C	2	2
G	D	3	5
H	G	5	3



Draw the resource aggregation graph using early start schedule. Carry out resource smoothing and draw the best levelled schedule and corresponding resource usage profile. [10]

Q. 5. The staffing manager of a well-known Hospital wishes to improve efficiency of the staffing process by reducing total time taken in 6 key tasks. He has to assign the tasks to five experienced employees for which he had computed the time to complete each task based of their effectiveness matrix.

Employee Time for Different Stages

Employee	Tasks (Time in Hours)					
	A	B	C	D	E	F
1	12	7	20	14	8	10
2	10	14	13	20	9	11
3	5	3	6	9	7	10
4	9	11	7	16	9	10
5	10	6	14	8	10	12

Determine the optimal assignment of employees to minimize total time taken for the staffing process. Is there an alternative optimal assignment possible? What is the minimum possible time for the assignments? [10]

The management discovers that due to union rules employee 2 cannot be assigned to task A and employee 5 cannot be assigned to task E. What, if any impact does this have on the optimal assignment? Are alternative assignments possible? [4]

- Q. 6. (a) What is the need for forecasting in health care operations? Explain in brief the various forecasting approaches that enable the healthcare managers to anticipate the future and plan service delivery. [4]

(b) The monthly ambulatory visits in an outpatient clinic are shown in table below:

Months	Visits
July	2160
August	2186
September	2246
October	2251
November	2243
December	2162

- a. Predict visits for January, using the naïve forecast method. [2]
 b. Predict visits for January, using a three - period moving average. [2]
 c. Predict visits for January, using a four - period moving average. [2]
 d. Prepare a forecast for January visits, using the simple exponential smoothing method with $\alpha = 0.3$. [2]
 e. Calculate MAD and MAPE for naïve, three- period and four- period forecasts. [2]
 Which forecast appears more accurate? [2]
- Q. 7. A multi-chain hospital wants optimize the distribution of medical supply materials to three hospitals from four warehouses in the region.

Blood bank location	Supply (no. of shipments)
Region A	50
Region B	80
Region C	70
Region D	140

The blood banks supply to three hospitals that have the following demands;

Hospital	Demand (no of Shipments)
H ₁	180
H ₂	90
H ₃	70

The following shipping costs per shipment (x 10 \$) have been determined.

Blood bank location	H ₁	H ₂	H ₃
A	40	70	20
B	10	30	30
C	70	40	50
D	20	60	10

As a Hospital Operations Manager, find the optimum distribution schedule and total minimum transportation cost. [14]

- Q. 8. Write short notes on any two of the following: [7 x 2]
- Statistical control charts in Quality Mgmt. in hospitals.
 - EOQ model in hospital supply chain management.
 - Queuing and capacity planning in hospitals.
 - 7-QC tools of Quality Management in hospitals.

